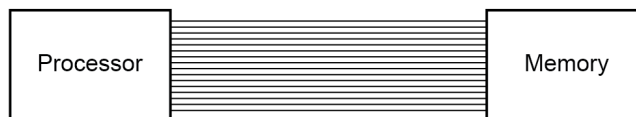




Worksheet 2 Processor performance

Task 1 Word length

1. Memory is divided into equal units called **words**. Each word has a separate memory address.



A processor uses a word length of 16 bits and has an address bus of 16 lines.

- (a) What is the maximum number of addressable words in memory?
 - (b) What is the overall memory capacity in KiB?
 - (c) How does the width of the address bus affect system performance?
 - (d) How does the width of the data bus affect system performance?
2. (a) Fill in the blanks from the words or phrases given below.
In _____, **word** is a term for the natural unit of data used by a particular _____ design. A word is a fixed-sized _____ handled as a unit by the _____ or the hardware of the processor. The number of _____ in a word (the _____) is an important characteristic of any specific processor design or _____.
bits computer architecture computing instruction set piece of data processor word length



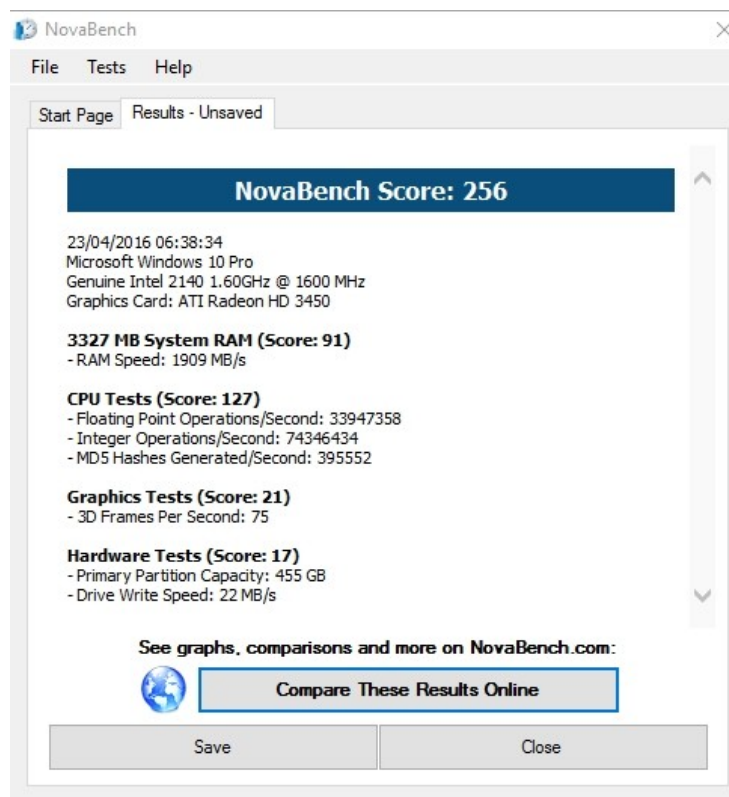
- (b) Complete the table to say whether each of the following statements is true or false.

	True or False
One assembly language instructions is generally translated into several machine code instructions	
The word length of the processor and the width of the address bus are factors in the format of a machine code instruction	
Different types of computers have different architectures and therefore different machine code instruction sets	
A processor with a 16-bit address bus cannot address more than 65,536 memory locations	

Task 2 - Testing system performance

3. Daniel tests the performance of his computer on the website <https://novabench.com/>

He obtains the following results:





He then compares them against average scores form other users:

STATS	
Our database for the past:	
Month · 3 Months · All Time	
Average Score:	973
Median Score:	821
Max Score:	3591
Min Score:	96
Std Deviation:	548
# of Results:	57855

Suggest possible reasons why his computer is performing poorly against the average. Is there anything he could do to improve performance?

4. Try benchmarking your own computer using the free downloadable software from the website.